



GARY HYDE ASSOCIATES

**342 HEYWOOD OLD ROAD,
MIDDLETON**

NOISE ASSESSMENT FOR PLANNING PURPOSES

13 December 2017

AEC REPORT: P3429/R1A/PJK

Prepared by:

A handwritten signature in black ink, appearing to read 'P. Knowles', with a long, sweeping horizontal stroke extending to the right.

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-	10 October 2017	Original Document	PJK	BT
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1.0 INTRODUCTION AND SITE DESCRIPTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) have been appointed by Grays Architecture on behalf of Gary Hyde Associates, to assess the noise levels affecting the proposed new build residential development at 342 Heywood Old Road, Middleton. This noise assessment is required to accompany a planning application for the scheme.
- 1.2 This report details the ambient and maximum noise levels measured on site, presents the assessment criteria and discusses the implication on the building design to achieve acceptable internal noise levels to meet the Local Authority requirements.
- 1.3 A scheme to build a three storey apartment block at 342 Heywood Old Road, Middleton, as identified on Figure 1, has been prepared by Grays Architecture.
- 1.4 The site is located within agricultural land and is bound to the west by Heywood Old Road (A6045), which links the M62 to the north and the M60 to the south.
- 1.5 To the northeast is a leisure centre and its associated car park and to the south is Bowlee Nursery.
- 1.6 Acoustic terminology used throughout the report is described in brief in Appendix A.

2.0 NOISE MEASUREMENTS

- 2.1 Night-time and daytime noise levels were measured by AEC on Friday 15 September 2017. Night-time noise levels were measured between 0440 and 0700h and daytime noise levels were measured between 0945 and 1200h.
- 2.2 Full details of the measurement procedure are included in Appendix B, with noise level data presented in Tables B1 and B2.
- 2.3 Daytime noise level measurements were undertaken in general accordance with the shortened measurement procedure presented in the Department of Transport Welsh Office's Calculation of Road Traffic Noise (CRTN). Additionally, both day and night-time measurements were undertaken in accordance with the measurement procedure presented in BS4142:2014 '*Methods for rating and assessing industrial and commercial sound*'.
- 2.4 Full noise levels were measured at a single location on the proposed development site, identified as A on Figure 1. Location A was selected to measure noise levels due to road traffic on Heywood Old Road.
- 2.5 Noise levels during the daytime were around 72dB_{L_{Aeq, 15minute}} and 77dB_{L_{A10, 15minute}} and at night ambient noise levels ranged from 67 to 76dB_{L_{Aeq, 15minute}} with maximum noise levels typically around 88dB_{L_{Amax}}.
- 2.6 Brief spot check measurements were undertaken at the rear of the site during both the daytime and night-time periods. During both these spot check measurements the dominant noise source was road traffic on Heywood Old Road and no other sources of noise were audible, which indicates there are no other significant noise sources in the area.
- 2.7 The lowest background noise levels measured during the day and night-time periods were 53dB_{L_{A90,T}} and 44dB_{L_{A90,T}} respectively.

3.0 BASIS OF ASSESSMENT

National Planning Policy Framework

- 3.1 The latest Planning Policies are included in the National Planning Policy Framework published by the Department for Communities and Local Government and dated March 2012. This document provides little mention of planning policies with regard to noise with the exception of paragraph 123 that states:

'Planning policies and decisions should aim to:

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'*

- 3.2 Further to the above, the Government's 'Planning Practice Guidance' dated 6 March 2014 indicates:

'Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.'

- 3.3 In addition, the guidance indicates that, whilst noise can override other planning concerns, it should not be considered in isolation from the economic, social and other environmental dimensions of any proposed development.
- 3.4 National Planning Practice Guidance, an online resource, brings together the aims of the NPPG and NPSE and tries to indicate how the likely perception and average response to noise relates to the effect levels. This is summarised in Appendix C below.

Local Authority Requirements

Noise Break-in

- 3.5 Following consultation with Paul Fletcher, a Public Protection Officer at Rochdale Borough Council, it is understood that the scheme should be designed to achieve internal noise levels of 35dB_{L_{Aeq}}, 16h in both living rooms and bedrooms during the day and 30dB_{L_{Aeq}}, 8h and 45dB_{L_{Amax}} in bedrooms at night due to anonymous noise sources, such as road traffic.
- 3.6 These levels are similar to guidance presented in BS8233:2014 'Guidance on sound insulation and noise reduction for buildings' and the World Health Organisation document "Guidelines for Community Noise" (1999).

- 3.7 In addition to providing internal noise limits, the WHO document also assumes that attenuation of external to internal noise levels provided by a window partially open for ventilation is up to 15dB. Therefore, for habitable rooms to be naturally ventilated via a partially open window, external noise levels due to anonymous noise sources, such as road traffic, should not exceed 50dB_{L_{Aeq,T}} during the daytime and 45dB_{L_{Aeq,T}} and 60dB_{L_{Amax}} during the night-time.

Noise from Building Services Plant

- 3.8 In relation to noise from any building services plant associated with the development, Paul Fletcher confirmed that noise from this source should be controlled to 5dB below the existing background noise level.

4.0 ASSESSMENT OF PROPOSED DEVELOPMENT

Noise Break-In

- 4.1 The daytime ambient noise level (dB_{L_{Aeq, 16h}}) at Location A, 5m from the nearest carriageway of Heywood Old Road, has been determined using the shortened measurement procedure in CRTN which is based on the measured L_{A10, 3h} of 77dB. To convert L_{A10, 3h} to a daytime average, L_{A10, 18h}, 1dB is subtracted.
- 4.2 To convert this to an ambient noise level, a further 2dB is subtracted, giving overall levels of 74dB_{L_{Aeq, 16h}} which is 2dB higher than the measured short-term ambient noise level at this location, and therefore, the higher level has been used in this assessment.
- 4.3 The daytime ambient noise level of 74dB_{L_{Aeq, 16h}} has been used to calculate the daytime ambient noise level affecting all four elevations of the proposed apartment block and these levels are presented in Table 1, below.
- 4.4 At night, although it is anticipated that ambient noise level would be lower in the period between 0100 and 0500h, the average ambient noise level of 72dB_{L_{Aeq, T}} measured over the period between 0500 and 0700h have been taken to be representative of the 8 hour period for the site.
- 4.5 Maximum noise levels at night were typically around 88dB_{L_{Amax}}, due to vehicle pass bys on Heywood Old Road.
- 4.6 The night-time ambient and maximum noise levels presented above have been used as the basis of assessment of the proposed apartment block and the calculated noise levels external to the four different elevations is presented in Table 1, below.

Table 1 – Calculated Noise Levels on the Different Elevations of Proposed Development

Elevation	Noise Levels, dB		
	Day	Night	
	L _{Aeq, 16h}	L _{Aeq, 8h}	L _{Amax}
Western	72	72	85
Northern	67	66	81
Southern	67	66	81
Eastern	52	50	59

- 4.7 As stated in paragraph 3.7, in order for habitable rooms to be naturally ventilated via a partially opened window, external noise levels should not exceed $50\text{dBL}_{\text{Aeq,T}}$ during the day and $45\text{dBL}_{\text{Aeq,T}}$ and $60\text{dBL}_{\text{Amax}}$ at night.
- 4.8 Comparing these allowable external noise levels with the calculated levels presented in Table 1, above, indicates that in order to achieve the required internal noise levels, windows would need to be kept closed to all habitable rooms, and ventilation would need to be provided by alternative means.
- 4.9 Mitigation measures are discussed in Section 5.

Noise from Building Services Plant

- 4.10 Based on the background noise levels measured on-site, the total noise level from all building services plant would need to be controlled to $48\text{dBL}_{\text{Aeq,T}}$ during the day and $39\text{dBL}_{\text{Aeq,T}}$ during the night-time at the nearest noise sensitive properties.
- 4.11 These level are not overly onerous, however, it is recommended that a noise assessment is undertaken once the scheme has been finalised.

5.0 MITIGATION MEASURES

- 5.1 The above assessment indicates that mitigation measures are required to control internal noise levels in living rooms and bedrooms on all elevations during both the day and night-time periods.
- 5.2 The glazing and ventilation sound insulation performances required to achieve the internal noise level limits in this development have been calculated based on the noise level spectra measured on site, and the drawings provided by Gray Architecture, and are presented in Table 2, below.
- 5.3 Example glazing build ups to achieve the required sound insulation performances are presented in Table 3, below.

Table 2 – Outline Requirements to Achieve Internal Noise Levels in Habitable Rooms

Elevation	Sound Insulation Performance			
	Daytime		Night-Time	
	Glazing	Ventilator	Glazing	Ventilator
Western	$38\text{dBR}_w / 32\text{dBR}_w + C_{tr}$	$44\text{dBD}_{n,e,w}$	$46\text{dBR}_w / 39\text{dBR}_w + C_{tr}$	MV*
Northern	$36\text{dBR}_w / 29\text{dBR}_w + C_{tr}$	$36\text{dBD}_{n,e,w}$	$38\text{dBR}_w / 32\text{dBR}_w + C_{tr}$	$44\text{dBD}_{n,e,w}$
Southern	$36\text{dBR}_w / 29\text{dBR}_w + C_{tr}$	$36\text{dBD}_{n,e,w}$	$38\text{dBR}_w / 32\text{dBR}_w + C_{tr}$	$44\text{dBD}_{n,e,w}$
Eastern	Standard Double Glazing	$26\text{dBD}_{n,e,w}$	Standard Double Glazing	$33\text{dBD}_{n,e,w}$

*MV = Mechanical Ventilation

- 5.4 A ventilation performance requirement of $44\text{dBD}_{n,e,w}$ is very onerous and would need to be achieved by a through the wall ventilator or an above the frame ventilator.

Table 3 – Example Glazing Build Up

Sound Insulation Performance	Glazing Build-Up
46dBR / 39dBR _w + C _{tr}	8.5mm Lami Glass / Thermal Cavity / 8.5 Lami Glass (Double Glazing)
	10mm Glass / 200 mm Cavity / 6mm Glass (Secondary Glazing)
38dBR _w / 32dBR _w + C _{tr}	10mm Glass / Thermal Cavity / 6mm Glass
36dBR _w / 29dBR _w + C _{tr}	10mm Glass / Thermal Cavity / 4mm Glass
Standard Double Glazing	4mm Glass / Thermal Cavity / 4mm Glass

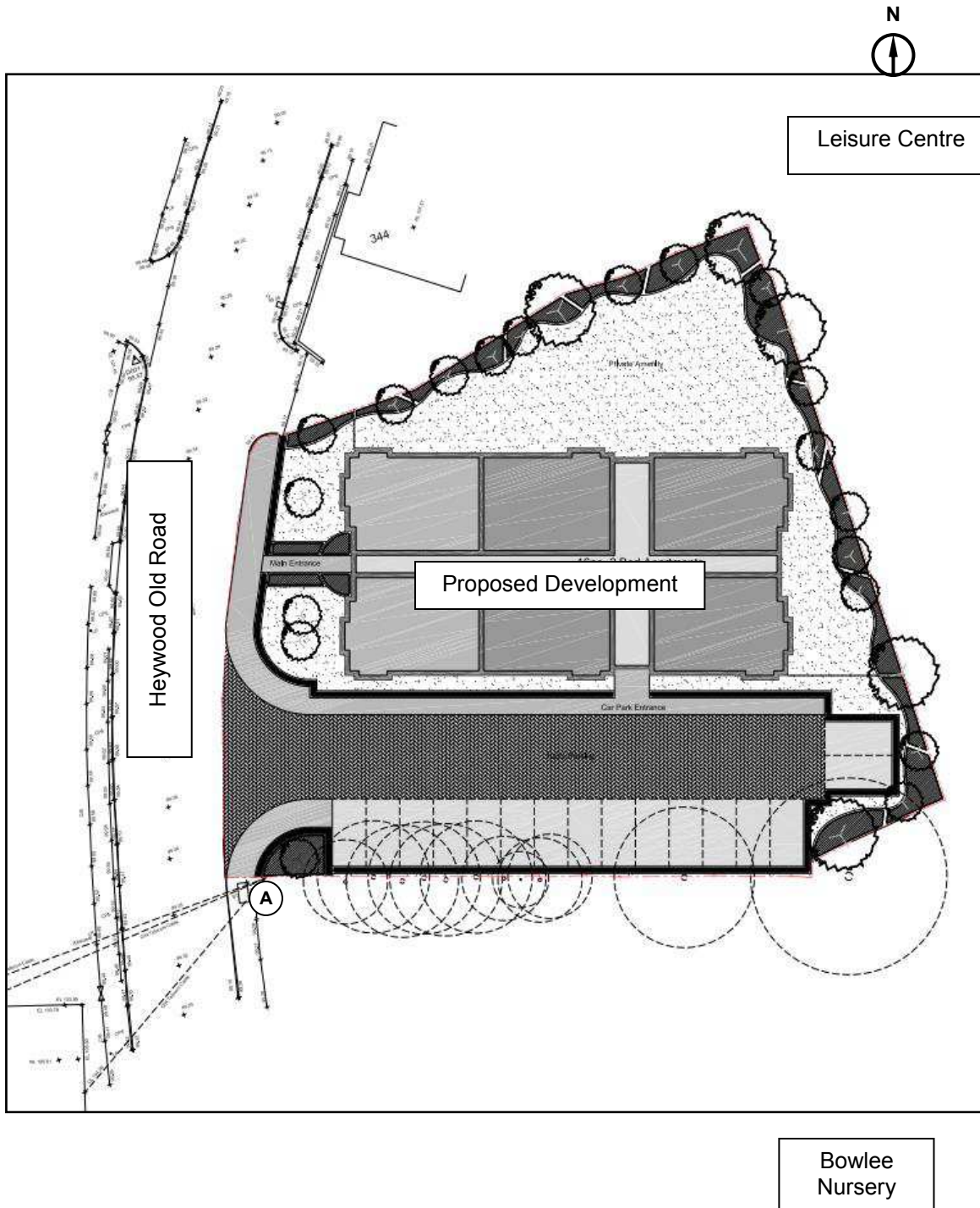
- 5.5 The windows can be openable provided that they are effectively sealed when closed and all frames and seals must not downgrade the required glazing sound insulation performance that is indicated above. If the glazing supplier cannot confirm that the frame will not downgrade the glazing then a higher sound insulation performance may be required.
- 5.6 All ventilation requirements have been based on the use of a single ventilator per room. If more than one unit is required, such as may be required to satisfy Building Control requirements, the performance of each unit would need to be increased.
- 5.7 Whilst the system will provide appropriate background ventilation levels without the future occupants having to normally rely on opening windows, opening windows will be necessary on occasion to provide rapid ventilation and at other times comfort cooling. At these times, internal noise levels will be elevated.
- 5.8 With regard to the other façade elements these should be selected in order that the on-site sound insulation performance (dBR'_w) is at least 10dB higher than the performances indicated in Table 2. This may require development at the design development stage.

6.0 CONCLUSIONS

- 6.1 Acoustic & Engineering Consultants Limited (AEC) have been appointed by Grays Architecture on behalf of Gary Hyde Associates, to assess the noise levels affecting the proposed new build residential development at 342 Heywood Old Road, Middleton.
- 6.2 Consultation has taken place with Paul Fletcher at Rochdale Borough Council and it was agreed that internal noise level limits due to anonymous sources, such as road traffic, would be controlled to meet the requirements of BS8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' and the WHO document "*Guidelines for Community Noise*".
- 6.3 The dominant noise sources around the site was road traffic on Heywood Old Road. The measured noise levels are presented in Section 2 and assessed against the design criteria in Section 4.
- 6.4 Based on the assessment above, mitigation measures are required to control internal ambient noise levels in all habitable rooms during both the daytime and night-time periods. The required mitigation measures in the form of appropriate enhanced glazing and acoustic ventilators, have been identified and are presented in Section 5, above.

- 6.5 As can be seen from the above, noise level due to road traffic on Heywood Old Road are relatively high, however, using the noise levels affecting the site are not considered to cause significant adverse effects and only basic mitigation measures are required to achieve appropriate internal noise levels.
- 6.6 Based on this, noise should not be considered a determining factor in relation to any planning permission being sought.

FIGURE 1 – Existing Site Showing Monitoring Locations



APPENDIX A - Acoustic Terminology in Brief

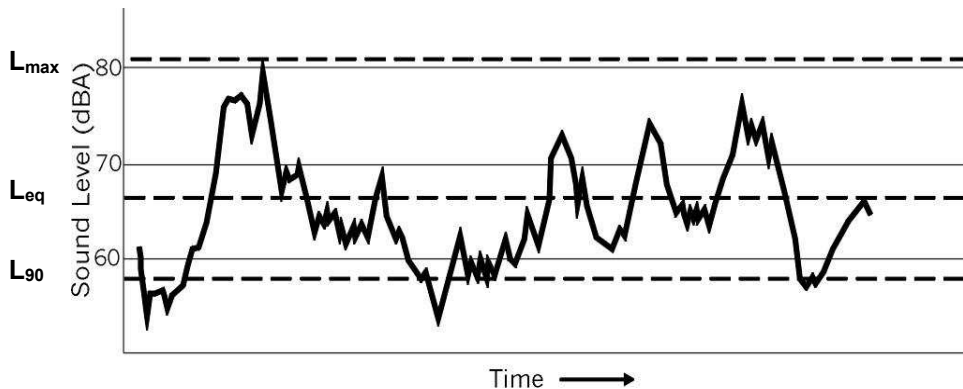
Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The dBA weighting emphasises or reduces the importance of certain frequencies within the audible range.

Noise Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as fifteen minutes or one hour, the statistically determined results being used to quantify various aspects of the noise.

The figure below shows an example of sound level varying with time. Because of this time variation the same period of noise can be described by several different levels. The most common of these are described below.



Example of Sound Level Varying With Time

$L_{Aeq,T}$ The equivalent continuous (A-weighted) sound level. May be thought of as the "average" sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises and can be considered as the "ambient" noise level.

L_{A10} The (A-weighted) sound level exceeded for 10% of a measurement period.

L_{A90} The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value used to describe the "background" noise.

L_{Amax} The maximum (A-weighted) sound level during a measurement period.

Free-field Level This refers to the sound level measured outside, away from reflecting surfaces.

Other Acoustics Units

R_w	Single number rating used to describe the <u>laboratory</u> airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
R_w + C_{tr}	As above only the resultant figure is adjusted by a spectrum adaptation term in relation to the low frequency sound insulation performance.
D_w	Single number rating used to describe the on-site airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
D_{n,e,w}	Single number rating used to describe the on-site airborne sound insulation performance properties of small building elements at frequencies, typically 100-3150Hz.
D_{n,e,w} + C_{tr}	As above only the resultant figure is adjusted by a spectrum adaptation term in relation to the low frequency sound insulation performance.

APPENDIX B – Noise Survey Details

Dates & Times of Survey: Night-time: Friday 15 September 2017, 0445 to 0700h
Daytime: Friday 15 September 2017, 0945 to 1200h

Personnel Present: Matthew Jones (AEC)

Equipment Used: B&K 2250 Real Time Analyser (AEC Kit 4)

Weather Conditions: Night-time: 10°C, little wind (2mph and NW) and 90% cloud cover.
Daytime: 12°C, little wind (3mph and NW) and 80% cloud cover

Measurement Procedure: Baseline noise levels were measured at one location, identified as A on Figure 1 and described below.

A – 5m from kerb on Heywood Old road and 5m from the edge of the site.

Locations A were selected to measure road traffic noise levels, which were measured in terms of L_{Aeq} , L_{A10} , L_{A90} and L_{Amax} (fast response) typically over 5 to 15 minute periods. All the measurements, were taken at a height of 1.5m above ground.

The sound level analyser, which conforms to BS EN 61672-1: 2013 '*Electroacoustics. Sound level meter. Specifications*' for Class 1 sound level meter. The meter was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.

Measured Data: A summary of the noise levels measured on-site are presented in Tables B1 and B2, below.

TABLE B1 – Measured Daytime Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	$L_{Amax, F}$	
A	0945 - 1001	72.8	77.3	56.6	85.8	Noise levels due to road traffic on Heywood Old road.
	1002 - 1017	72.1	76.6	55.5	89.2	
	1019 - 1035	72.4	76.9	55.8	87.0	
	1046 - 1101	70.9	75.5	54.9	83.8	
	1103 - 1118	72.2	76.7	57.7	83.0	
	1119 - 1134	71.9	76.5	53.1	85.5	
	1145 - 1200	72.2	76.5	56.7	87.6	

TABLE B2 – Measured Night-Time Noise Levels

Location	Period, h	Noise Level, dB			Comments
		L _{Aeq}	L _{A90}	L _{Amax, F}	
A	0447 - 0503	67.4	44.4	86.0	Noise levels due to road traffic on Heywood Old road.
	0521 - 0536	69.2	46.4	85.4	
	0537 - 0551	70.6	47.0	88.0	
	0552 - 0607	72.7	50.1	87.4	
	0607 - 0622	73.7	52.6	87.7	
	0632 - 0647	75.5	59.1	86.2	
	0648 - 0703	76.1	59.4	85.7	

APPENDIX C – National Planning Practice Guidance

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prev